

What is claimed is:

1. A method for determining whether a substance is an activator or an inhibitor of a function of a protein comprising: (a) contacting the protein
5 with a substance to be tested, wherein the protein is a DHAM-kinase; and (b) measuring whether the function is inhibited or activated.
2. A method for determining whether a substance is an activator or an inhibitor of a function of a protein comprising: (a) contacting the protein
10 with a substance to be tested, wherein the protein is a variant, mutant or fragment of a DHAM-kinase having a function of the corresponding DHAM-kinase; and (b) measuring whether the function is inhibited or activated.
- 15 3. The method according to claim 1 wherein the inhibition or activation of the desired function is measured directly.
4. The method according to claim 1 wherein the inhibition or activation of the desired function is measured indirectly.
- 20 5. The method according to claim 1 wherein the DHAM-kinase is a mammalian DHAM-kinase.
6. The method according to claim 5 wherein the DHAM-kinase is a human
25 DHAM-kinase.
7. The method according to claim 1 wherein the method is performed using a cellular system.
- 30 8. The method according to claim 1 wherein the method is performed using a cell-free system.

9. The method according to claim 1 wherein the DHAM-kinase consists of an amino acid sequence selected from the group consisting of: SEQ ID NO:4, SEQ ID NO:10, and SEQ ID NO:12.
- 5 10. The method according to claim 9 wherein the amino acid sequence is SEQ ID NO:4.
11. The method according to claim 9 wherein the amino acid sequence is a variant, mutant or fragment of SEQ ID NO:4 having the same function of
10 SEQ ID NO:4.
12. The method according to claim 9 wherein the amino acid sequence is SEQ ID NO:10.
- 15 13. The method according to claim 9 wherein the amino acid sequence is a variant, mutant or fragment of SEQ ID NO:10 having the same function of SEQ ID NO:10.
14. The method according to claim 9 wherein the amino acid sequence is
20 SEQ ID NO:12.
15. The method according to claim 9 wherein the amino acid sequence is a variant, mutant or fragment of SEQ ID NO:12 having the same function of SEQ ID NO:12.
25
16. The method according to claim 1 wherein the function is a kinase activity.
17. The method according to claim 16 wherein the function is substrate
30 binding.

18. The method according to claim 16 wherein the function is a specific phosphorylation of a substrate.
19. A method for determining an expression level of a DHAM-kinase
5 comprising: (a) determining the level of the DHAM-kinase expressed in a hyperactivated macrophage; (b) determining the level of the DHAM-kinase expressed in a non-hyperactivated macrophage; and (c) comparing the level of the DHAM-kinase expressed in step (a) to the level of the DHAM-kinase expressed in step (b), wherein a difference in
10 levels indicates a differentially expressed DHAM-kinase.
20. The method according to claim 19 wherein the macrophage is a mammalian macrophage.
- 15 21. The method according to claim 20 wherein the macrophage is a human macrophage.
22. The method according to claim 19 wherein the difference in expression level is determined at the DHAM-kinase nucleic acid level.
20
23. The method according to claim 19 wherein the difference in expression level is determined at the DHAM-kinase protein level.
24. The method according to claim 23 wherein the DHAM-kinase protein
25 consists of an amino acid sequence selected from the group consisting of: SEQ ID NO:4, SEQ ID NO:10, and SEQ ID NO:12.
25. The method according to claim 24 wherein the amino acid sequence is
30 SEQ ID NO:4.

26. The method according to claim 24 wherein the amino acid sequence is a variant, mutant or fragment of SEQ ID NO:4 having the same function of SEQ ID NO:4.
- 5 27. The method according to claim 24 wherein the amino acid sequence is SEQ ID NO:10.
28. The method according to claim 24 wherein the amino acid sequence is a variant, mutant or fragment of SEQ ID NO:10 having the same function
10 of SEQ ID NO:10.
29. The method according to claim 24 wherein the amino acid sequence is SEQ ID NO:12.
- 15 30. The method according to claim 24 wherein the amino acid sequence is a variant, mutant or fragment of SEQ ID NO:12 having the same function of SEQ ID NO:12.
31. A method for diagnosing or monitoring a chronic inflammatory airway
20 disease comprising: (a) determining the level of a DHAM-kinase expressed in a hyperactivated macrophage; (b) determining the level of the DHAM-kinase expressed in a non-hyperactivated macrophage; and (c) comparing the level of the DHAM-kinase expressed in step (a) to the level of the DHAM-kinase expressed in step (b), wherein a difference in
25 levels indicates a differentially expressed DHAM-kinase.
32. The method according to claim 31 wherein the difference in expression level is determined at the DHAM-kinase nucleic acid level.
- 30 33. The method according to claim 31 wherein the difference in expression level is determined at the DHAM-kinase protein level.

34. The method according to claim 31 wherein the chronic inflammatory airway disease is selected from the group consisting of chronic bronchitis and COPD.
- 5 35. The method according to claim 31 wherein the method is performed using a macrophage or a part thereof obtainable from a site of inflammation.
- 10 36. A substance determined to be an activator or an inhibitor of a DHAM-kinase.
37. A substance determined to be an activator or an inhibitor of a DHAM-kinase according to the method of claim 1.
- 15 38. A substance for the treatment of a disease wherein the substance is an activator or an inhibitor of a DHAM-kinase.
39. The substance according to claim 38 wherein the disease is a chronic inflammatory airway disease.
- 20 40. The substance according to claim 39 wherein the chronic inflammatory airway disease is selected from the group consisting of: chronic bronchitis and COPD.
- 25 41. A pharmaceutical composition comprising at least one substance which is an activator or an inhibitor of a DHAM-kinase; and a pharmaceutical carrier.
- 30 42. A pharmaceutical composition comprising at least one substance which is determined to be an activator or an inhibitor of a DHAM-kinase according to the method of claim 1; and a pharmaceutical carrier.

43. A pharmaceutical composition comprising at least one substance which is determined to be an activator or an inhibitor of a DHAM-kinase according to the method of claim 9; and a pharmaceutical carrier.
- 5 44. A method for treating a chronic inflammatory airway disease comprising: administering to a subject in need of such treatment an effective amount of a pharmaceutical composition comprising at least one substance determined to be an activator or an inhibitor of a DHAM-kinase.
- 10 45. The method according to claim 44 for treating a mammal.
46. The method according to claim 44 for treating a human being.
- 15 47. The method according to claim 44 for treating a chronic inflammatory airway disease selected from the group consisting of chronic bronchitis and COPD.
- 20 48. A method for treating a chronic inflammatory airway disease comprising: administering to a subject in need of such treatment an effective amount of a pharmaceutical composition comprising at least one substance determined to be an activator or an inhibitor of a DHAM-kinase according to the method of claim 1.
- 25 49. A method for treating a chronic inflammatory airway disease comprising: administering to a subject in need of such treatment an effective amount of a pharmaceutical composition comprising at least one substance determined to be an activator or an inhibitor of a DHAM-kinase according to the method of claim 9.
- 30 50. A method for selectively modulating a DHAM-kinase in a macrophage, comprising administering a substance determined to be an activator or an inhibitor of a DHAM-kinase.

51. The method according to claim 50 wherein the macrophage is involved in a chronic inflammatory airway disease.
- 5 52. The method according to claim 50 wherein the chronic inflammatory airway disease is selected from the group consisting of: chronic bronchitis and COPD.
- 10 53. A method for selectively modulating a DHAM-kinase in a macrophage, comprising administering a substance determined to be an activator or an inhibitor of a DHAM-kinase according to the method of claim 1.
- 15 54. A method for selectively modulating a DHAM-kinase in a macrophage, comprising administering a substance determined to be an activator or an inhibitor of a DHAM-kinase according to the method of claim 9.